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ABSTRACT

Operating technicians play a number of roles in video, or televised, distance learning programs, the most obvious being the operation and support of the technology itself. Very little information exists, however, about the non-technical activities of technicians that may influence the instruction process. This paper describes these activities during the pre-instructional, instructional, and post-instructional phases of the video distance learning process. The study population consisted of four operating technicians from four sites of a university-based video distance learning program using compressed video technology. Their views were solicited as part of an evaluation of the institution's health professionals distance learning programs. Data were collected during a single focus group session conducted over the compressed video system. The interview guide for the session was based on important considerations identified by a review of distance learning literature. A thematic analysis was performed on session transcripts. Conclusions were accepted if they met two criteria: author group consensus and consistency with raw data. Results indicate that operating technicians undertake activities that can directly or indirectly influence the video distance learning environment. Directly, they can influence the learning environment by assisting instructors with course logistics and testing, operating and maintaining the technology, and controlling broadcast production and quality. Indirectly, they influence the learning environment by orienting participants to the technology, reducing the anxiety of participants about their involvement with the technology, and advising on instructional technique. It was also found that technicians do arrive at opinions about the competence of instructors to teach using video technology, and that these opinions are not always conveyed to instructors, and that technicians underestimate their ability to influence and improve the learning environment. (MAS)

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The Operating Technician's Role in Video Distance Learning

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Operating technicians play a number of important roles in video, or televised, distance learning programs. The most obvious of these are the operation and support of the technology itself. Very little information exists, however, about the non-technical activities of technicians that may influence the instruction process. The data for this report were gathered as part of a larger investigation on distance learning in the health professions in a university-based program. A separate focus on the roles of operating technicians was included as part of the study to identify activities that might affect the distance learning environment. The work that follows describes these activities during the pre-instructional, instructional and post-instructional phases of the video distance learning process.

Conceptual Framework

We assumed that the effectiveness of instruction and learning in video distance learning is determined by a complex interaction between students, instructors and operating technicians within the learning environment (Saba & Twitchell, 1988). Our view of the learning environment is consistent with Dewey's (1938): we see learning as an interaction of learners with the environment in a learning situation. The learning situation is defined by two sets of conditions: the external, which defines the learning environment and the internal, defined by the needs, desires, purposes and capabilities of the learner. The environment is inclusive of subject matter, methods of instruction, institutional organization and material resources. The learning process in video distance learning programs differs from traditional classroom situations because operating technicians, as well as instructors, influence the environment. We categorize the activities of the operating technicians into pre-instructional, instructional and post-instructional phases as defined by Geis (1974).

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Methodology

The study population consisted of four operating technicians from four sites of a university-based video distance learning program using compressed video technology. Their views were solicited as part of an evaluation of the institution's health professions distance learning programs. The four technicians were specifically recruited because they were the only full-time operating technicians on duty during instruction related to the health professions education programs. All four also had past experience with other distance learning programs in the same institution as well.

Data were collected during a single focus group session with the technicians that was conducted over the compressed video system. The interview guide for the session was based on important considerations identified by a review of distance learning literature. Video and audio records of the session were produced and used to prepare a transcript of the interview for open-coding (Glaser & Strauss, 1967). A thematic analysis was subsequently performed by the first author and his interpretations were checked and modified using group hypothesis testing by the remaining authors. Conclusions were accepted if they met two criteria: group consensus and consistency with raw data from the focus group interview.

Results

Role Definition

The data indicated that the technician's role in distance learning went beyond the purely technical functions of operating and maintaining the compressed video system. Although they reported undertaking tasks that could influence the distance learning process, the technicians did not perceive their own role as having the potential for such an influence. For example one described his duties in these words, "Ah, just keeping the equipment working, that's the only way that I can see it. We don't actually teach." To a considerable degree the technicians' non-technical involvement in the process was determined from their prior experiences with instructors and students and from a common sense view of what they felt needed to be done and how they could be helpful. There was a self-defined element to the technicians' role that appeared to go beyond the prescription of supervisors or position descriptions. Specific role content varied substantially from one technician to another.

Pre-Instructional Activities

The technicians reported providing a considerable amount of pre-instructional support to program participants[1]. This involved orientation to the system, logistical and production support, and reducing the anxiety of participants to the distance learning environment. A number of their comments suggested that such pre-instructional activities as system orientation and initiating conversation were undertaken in an attempt to reduce the anxiety level of participants by demystifying the technology and developing confidence in the technician.

> Well, when a person walks into one of these locations, "Oh my goodness, all of this," But once you explain it to them and first of all tell them it's not, when they see themselves on television, that it's not national TV and that relaxes them somewhat. And then after you show them the basics they say "Oh...it's not as complicated as I thought it looked," so I certainly think that it's beneficial to, once they know a little bit about it, then they feel somewhat better about it and are more apt to take control over it and learn it hands on.

Technicians also facilitated the distribution of instructional and evaluation materials between participants and served as examination proctors.

Responsibility for ensuring that the compressed video system was functioning properly and that all instructional sites were electronically connected rested with the technicians. At the beginning of each instruction session the technicians engaged in a process of initialization, i.e., making certain that the equipment was functioning and making minor adjustments as necessary.

Instructional Activities

During the instruction phase technicians engaged in activities that helped to determine who had control of the system. Control of the system either remained fully with technicians or became a shared responsibility between technicians and participants. Control sharing depended on a variety of factors. One was the technician's perception of participants' competence to control various system functions. Competence of new participants was informally assessed during the first few instructional sessions and the technicians adjusted their level of involvement accordingly.

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[1]Note: The term *participants* will be used when referring to *both* instructors and students.

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> And for the first week or so I sometimes stay the whole class period in this room and just because I feel maybe that someone needs, something happens and nobody knows. But as it goes along and everybody gets used to it, a lot of times you can pick out either the instructor...[or] a student. I can leave the remote control and say, you know, "Do what you can, if you take a break, put it on camera 3 and...hit mute." Come back you know, and [if] they know how to do that after, you know, you learn them, then you feel more like staying, being out of the room a little more because...the system's working fine and everything's going fine.

In general, the technicians initially anticipated low levels of competence with regard to an instructor's ability to control the system, even though some instructors received a prior orientation to distance learning and the compressed video system.

> Well, you show them the remote control. There's four cameras basically, you know, there's the volume control, the mute, you know that's basically it. They don't zoom in. We don't even give them the remote control here because they just get things out of whack a lot of times as far as audio is concerned, feedback, echoing, things like that.

When asked if the technicians could tell the difference between instructors who had completed a brief orientation course on the compressed video system and those who had not they commented

> Very, very slight. Until they actually do it I don't see how a person can feel, you know, comfortable.

* * * * *

> I don't think so. I don't think....the training just, the initial training just shows them how the system works and what it looks like, not actually using it. Until you actually use it, you really don't learn it.

The technicians noted that an important function of theirs was to supplement this previous training. They felt that until the instructors actually used the system they could not begin to develop the desired competence level. The technicians developed heuristics that were used to assess whether or not to share control with participants. In some cases the technicians gave participants the choice of assuming control for some system functions during presentations.

The degree to which technicians were available during instruction was related to the physical environment at each site and the degree of shared control. Two sites had a separate control room which technicians could use to monitor transmissions. The other two sites lacked control rooms; all system control had to be managed in the same room occupied by the participants. The arrangement in the latter two sites forced decisions of whether or not to cede system control to participants each time the technician left the room. In general, technician availability was highest during the first few class sessions and lessened as participants

became more familiar with the system. Also, technicians reported that after the initialization phase, most instructors felt little need for the technician to be present.

> Yeah, I've, I've had instructors to say "Hey, you know, feel free to go" I, I think, we, you know , we had a little thing over the control. I've never actually had an instructor to tell me "No, please don't go. Stay, because I can't handle it" you know, I've certainly never had that problem either. Most people understand it after a certain amount of time since they feel comfortable when you're out of the room.

The technicians also used information gained from their observations during the instructional phase to form opinions about instructors' instructional competence. Their criteria for what constituted good instruction included how an instructor interacted with students, presence while on camera, perceived degree of course preparation, and quality of visual material used during instruction.

> I've had instructors be at the podium and...they get fidgety and want to move around. I've had them to move completely out of the camera [range] because they don't notice the little monitor beside them....I've kind of had to wave them back in. But, that's one out of a hundred.

* * * * *

> Yeah, one thing I have noticed about the instructors is a lot of times, the written material that they try to present on the Elmo[2]. They'll try to lay a book right down in front of it and zoom in on a whole page and just the way the page is laid out if you get all the letters in there you can barely read it.

The technicians also stressed the need for instructors to adapt their instructional styles to the new technology.

> The hardest part I see is the instructor adapting to the equipment. It's a piece of equipment, it can't change. Just the instructor has to change to make it work properly. That's the only problem.

* * * * *

> Well, most instructors are used to taking a 2x2 and shooting it up on the wall....But now, because of the video source, you can't do that. They like to use overheads and throw them up on the walls to write on and most instructors like to take a pointer and point at'em, slides, for instance, and usually the overhead camera and the document stand is the same thing...It just takes them a while to adapt to the changes. You know, instead of looking at it on a wall they have to look at it on the monitor.

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[2]The Elmo is a commercial device which uses a small television camera mounted atop a telescoping arm. It is used to transmit slides, overheads or other visuals to a video monitor.

Post-Instructional Activities

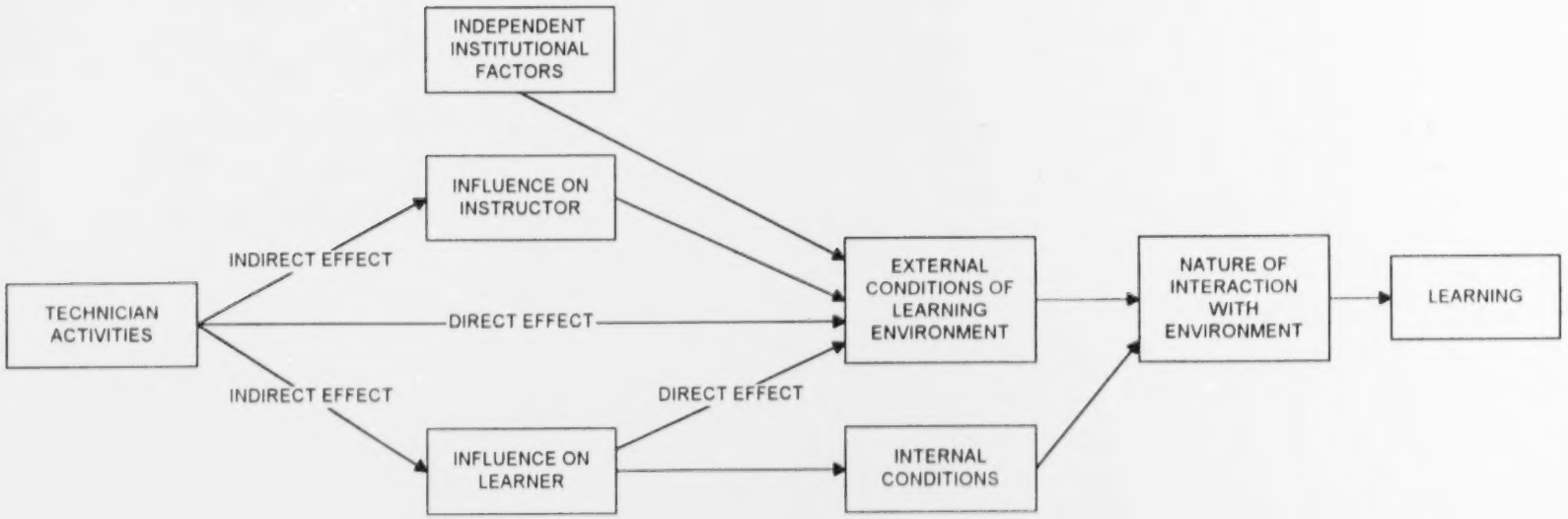
Post-instructional activities were limited to infrequent conversations with participants about the instruction phase. Technicians reported questioning students about their satisfaction with video distance learning and participants about need of future assistance from technicians. The technicians implied that they were reluctant to initiate discussions with instructors about improvements in their technique. They reported making a few suggestions, but their comments suggested they felt this advice may have been undervalued or ignored by instructors.

Although the technicians played a role in supporting distance learning, their level of involvement in the process was variable and also depended on motivational factors. Factors fostering a higher level of involvement included personal interest in course content and the degree to which assistance was accepted by participants. Level of involvement during the instructional phase also appeared to be related to the nature of the physical facilities and the technicians' prior training and experience.

Discussion

This study indicates that operating technicians undertake activities that can directly or indirectly influence the video distance learning environment. Based on this study a model for conceptualizing technician influence has been developed (see Figure). McCleary and Egan (1989) commented on the importance of a facilitator's role in distance learning. Our findings suggest that when this role is unfilled, operating technicians take it upon themselves to fill portions of it. Directly, they can influence the learning environment by assisting instructors with course logistics and testing, operating and maintaining the technology and controlling broadcast production and quality. Indirectly, they can influence the environment by orienting participants to the technology, reducing the anxiety of participants about their involvement with the technology and advising on instructional technique. These activities may affect the internal condition of the learner and their receptiveness to learning in the video environment, and may also alter the ability of instructors to control the learning environment. The findings also suggest that the interaction between operating technicians and program

FIGURE. MODEL OF OPERATING TECHNICIAN EFFECTS ON THE DISTANCE LEARNING ENVIRONMENT



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participants is a dynamic process which changes as technicians become more knowledgeable about the abilities of participants to use the system.

This study demonstrates that operating technicians do arrive at opinions about the competence of instructors to teach using video technology, and that these opinions are not always conveyed to instructors. There are a number of reasons why these opinions may not be shared between technician and instructor. One may be that neither group perceives this as the technician's responsibility. Another may be that perceived differences in status between technicians and instructors may preclude such communication. Because this aspect of the technicians' role was self-ascribed, neither they nor the instructors seemed clear about the appropriateness of this observation and feedback. The results suggest that instructors in a distance learning environment that includes technicians could benefit from their opinions if discussion of them could be accomplished in a manner that was non-threatening to both. Conversely, the technicians might also benefit from feedback received from instructors or other sources regarding their performance or that of the technology. Indeed, one of the complaints expressed by the technicians was that they did not receive feedback about their roles from course evaluations.

The findings also suggest that technicians underestimate their ability to influence and improve the learning environment. This may be due to a lack of a formalized instructional assistance role for the technicians. Instruction in the video distance learning environment is a synergistic process. Its effectiveness is dependent not only on the performance and interaction of instructor and technician, but on the extent to which they can complement each other through a team approach. The importance of this synergism is recognized by the commercial television industry, but may not be recognized in distance learning programs because of the relative novelty of the process. Video distance learning has both an instructional and a technical component. To the extent that participants can be insulated from technical considerations by operating technicians, the instructional process should be more efficient (Dillon et al., 1990). Technicians can also enhance the efficiency of this process by supporting instruction in a facilitative role that goes beyond dealing solely with equipment.

This study was undertaken to identify activities of operating technicians that might influence the video distance learning environment. Such activities were identified, but no conclusions can be drawn as whether the

activities of the technicians interviewed for the study actually influenced learning environments or, ultimately, learning. This remains for future study using other designs.

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